

Collector Sizing

Collector sizing depends on the magnitude of the building ventilation and the wall area available for mounting the transpired solar collector.

V_{bldg}	=	building outdoor airflow rate	_____	cfm
A_{avai}	=	available wall area for collector	_____	ft ²
v_{min}	=	minimum collector flow rate (typically about 4 cfm/ft ²)	_____	cfm/ft ²
v_{max}	=	maximum collector flow rate (typically about 8 cfm/ft ²)	_____	cfm/ft ²
A_{min}	=	minimum collector area (ft ²)		
A_{max}	=	maximum collector area (ft ²)		
A_{coll}	=	design collector area (ft ²)		
V_{coll}	=	total flow rate through the collector (cfm)		
v_{coll}	=	flow rate per unit collector area (cfm/ft ²)		

$$A_{\text{min}} = \frac{V_{\text{bldg}}}{v_{\text{max}}} = \text{_____} \text{ ft}^2$$

$$A_{\text{max}} = \frac{V_{\text{bldg}}}{v_{\text{min}}} = \text{_____} \text{ ft}^2$$

1) if $A_{\text{avail}} > A_{\text{max}}$, then	$A_{\text{coll}} = A_{\text{max}}$	=	_____	ft ²
	$V_{\text{coll}} = V_{\text{bldg}}$	=	_____	cfm
	$v_{\text{coll}} = v_{\text{min}}$	=	_____	cfm/ft ²

2) if $A_{\text{min}} < A_{\text{avail}} < A_{\text{max}}$, then	$A_{\text{coll}} = A_{\text{avail}}$	=	_____	ft ²
	$V_{\text{coll}} = V_{\text{bldg}}$	=	_____	cfm
	$v_{\text{coll}} = V_{\text{bldg}} \div A_{\text{avail}}$	=	_____	cfm/ft ²

3) if $A_{\text{avail}} < A_{\text{min}}$, then	$A_{\text{coll}} = A_{\text{avail}}$	=	_____	ft ²
	$V_{\text{coll}} = A_{\text{avail}} \times v_{\text{max}}$	=	_____	cfm
	$v_{\text{coll}} = v_{\text{max}}$	=	_____	cfm/ft ²

Figure 8. Collector sizing worksheet.